भारतीय मानक
Indian Standard

IS 11862 : 2021

द्रवचालित लोडसेल — विशिष्टि

(पहला पुनरीक्षण)

Hydraulic Loadcell — Specification

(First Revision)

ICS 73.100.30

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Mining Techniques and Equipment Sectional Committee, MED 08

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Mining Techniques and Equipment Sectional Committee had been approved by the Mechanical Engineering Divisional Council.

This standard was first published in 1986. This standard is the first revision. In this revised standard, the capacity range for a loadcell has been restricted to 500 kN for both H and V type of gauge mounting. Maximum hole diameter size has been provided for a loadcell with a maximum load capacity of 20t and 30t. Specification of Remote gauge mounted loadcell has been removed from this revision. The provision of loadcell manufactured with swivelling arrangement on the top plate has also been removed.

The composition of the Committee responsible for the preparation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

HYDRAULIC LOADCELL — SPECIFICATION

(First Revision)

1 SCOPE

This standard covers the requirements of hydraulic loadcells for static operation and compression application.

2 CLASSIFICATION

The loadcells are classified as follows depending upon the mounting of the gauge:

a) H – Horizontal gauge mounted; and

b) V – Vertical gauge mounted.

3 DIMENSIONS

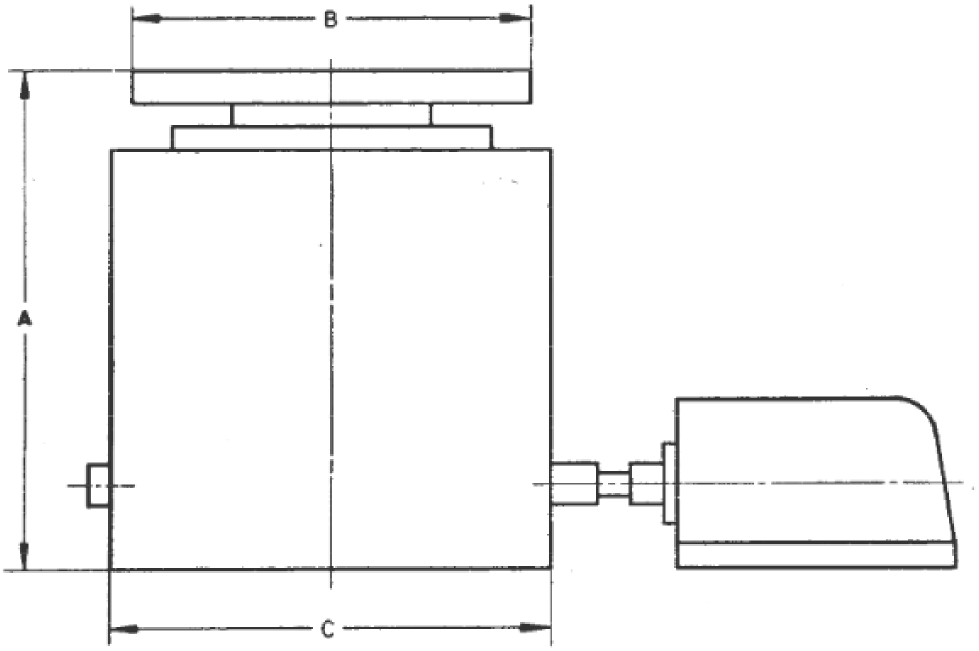
The dimensions of loadcell shall be as given in Table 1.

4 CONSTRUCTION, WORKMANSHIP, AND CALIBRATION

4.1 The loadcell may be manufactured with either flat or spherical seating.

4.2 All the components shall be precision machined.

4.3 All the external edges shall be free from burrs.



All dimensions in millimetres

Table 1 Dimensions

(*Clause* 3)

Capacity and Classification Code	Capacity Range	A Max	B Max	C Max	Hole Dia. Max
20 H	0 to 200 kN (≈ 20 t)	100	80	80	25
20 V					
30 H	0 to 300 kN (≈ 30 t)	125	100	100	30
30 V					
50 H	0 to 500 kN (≈ 50 t)	125	150	150	–
50 V					

4.4 Cylinder shall be honed.

4.5 The gauge fitted on loadcell shall have an accuracy of the calibration of ±2 percent of maximum scale reading. For this requirement 1 in 10 gauges of loadcells selected at random shall be checked. The calibration of the gauge over its full range may be done either by comparison with a master gauge or a dead weight pressure tester.

4.5.1 The gauge fitted on the loadcell shall have a second needle, with an external arrangement to reset it at zero, to indicate the maximum load registered.

4.5.2 The gauge fitted on the loadcell shall have a least count of 5 kN (0.5 t) for the loadcells up to and including a maximum load capacity of 300 kN (30 t) and 10 kN (1 t) for loadcells above 300 kN (30 t) maximum load capacity.

4.5.3 A metallic cover shall be provided on the dial gauge for its protection.

4.5.4 Central bore hole 25 mm for 20T loadcell and 30 mm hole for 30T loadcell shall be provided. 50T loadcell shall be without any central bore hole.

5 TESTS

5.1 Type Tests

The tests given in **5.3** to **5.6** shall be carried out by a duly approved testing organization on the prototype on a loadcell selected at random from the lot first offered.

5.2 Routine Tests

5.2.1 All the loadcell shall be checked for requirements laid down in 3 and those not meeting the requirements shall be rejected.

5.2.2 A minimum of 0.5 percent of the production of the loadcells or a minimum of one loadcell in case of production being less than 100 loadcells meeting the requirements of **5.2.1** shall be subjected to tests laid down in **5.3** and **5.4**.

5.3 Performance Test

The loadcell shall be subjected to a load of 100 percent of its maximum capacity for one day continuously followed immediately by loading it to 125 percent of its maximum capacity for 30 min. After the test, the loadcell shall not show any sign of leakage. It shall be then checked for its accuracy of calibration and shall meet the requirement laid down in **4.5**.

5.4 Static Leakage Test

5.4.1 *Leakage in Unloaded Loadcells*

A note shall be taken of any tendency for hydraulic fluid to leak from the loadcell. With the loadcell lying on the ground either in horizontal or in an inclined position or in the vertical position, it shall be noted if there is any hydraulic fluid leak from the loadcell. Loadcells having leak (s) shall be rejected.

5.4.2 *Leakage in Loadcells in Loaded Condition*

The loadcell shall be checked at a load of 25 percent of its maximum capacity. The total loss of load shall be recorded for a period of 24 h and it shall not be more than 2 percent of the maximum capacity of the loadcell.

5.4.3 The test in **5.4.1** and **5.4.2** shall be carried out after completion of the test in **5.3.**

5.5 After conducting the tests specified in **5.3** and **5.4** the loadcell shall be dismantled for the observation of any damage to loadcell or its components. In case of damage, the cause shall be found out and rectified in the loadcells of the lot represented by the loadcell undergone tests in **5.3** and **5.4.**

5.6 Retesting

In case of failure of loadcells (s), cause (s) of failure shall be investigated and rectified and the loadcell (s) retested. Further, loadcells (s) in number equal to the sample size initially taken in accordance with **5.2.2** shall be selected at random from the remaining lot and tested. The lot shall be accepted if all the samples pass.

6 DESIGNATION

A loadcell of 300 kN (30 t) maximum capacity with Horizontal gauge mounted shall be designated as:

LC 30 H

7 MARKING

7.1 Each loadcell shall be marked with the designation and manufacturer’s name and/or his recognized trademark.

7.2 Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Mining Techniques and Equipment Sectional Committee, MED 08

Organization	*Representative(s)*
Directorate General of Mines Safety, Dhanbad	Shri T. R. Kannan (***Chairman***) Shri M. Arumugam (*Alternate*)
Andhra Pradesh Heavy Machinery and Engineering Ltd, Vijaywada	Shri T. V. Ramana
Bharat Earth Movers Ltd, Bengaluru	Shri V. R. S. Prasad Rao Shri H. G. Suresh (*Alternate*)
Caterpillar India Private Limited, Chennai	Shri K. Reji Jose
Central Mine Planning and Design Institute Ltd, Ranchi	Shri S. K. Chaterji Shri U. Roy (*Alternate*)
Central Institute of Mining and Fuel Resesarch, Dhanbad	Dr M. K. Singh Shri Surajit Dey (*Alternate*)
Eastern Coalfields Limited, Sanctoria	Shri Manas Kumar Mishra
EIMCO Elecon (India) Ltd, Vallabh Vidyanagar	Shri B. K. Bhatt
Hindustan Copper Ltd, Kolkata	Shri R. C. Singla Shri P. K. Sharma (*Alternate*)
Hindustan Zinc Limited, Udaipur	Shri B. V. Rao
John Deere, Pune	Shri Kaliappan Karthik
Manganese Ore (India) Ltd, Nagpur	Shri Rajesh Verma Shri Atul Sharma (*Alternate* I) Shri Ashwini Baghele (*Alternate* II)
Nanda Millar Company, Kolkata	Shri J. P. Goenka Shri Madhur Goenka (*Alternate*)
National Mineral Devlopment Corporation, Hyderabad	Shri D. Rajasekaran Shri Pradeep Kumar (*Alternate*)
South Eastern Coalfields Ltd, Bilaspur	Shri Kapil K. Rai Shri D. Bhattacharjee (*Alternate*)
Tata Steel Ltd, Dhanbad	Shri Soumendhu Manjhi
Directorate General of BIS, New Delhi	Shri Rajneesh Khosla, Scientist 'E' and Head (MED) [Representing Director General (*Ex-officio*)]

Member Secretary

Shri sandeep keshav
Scientist 'C' (MED), BIS

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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